High Resolution
Mobile Thermal Imaging Device

Operation Manual

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Visit Therm-App® website: www.therm-app.com

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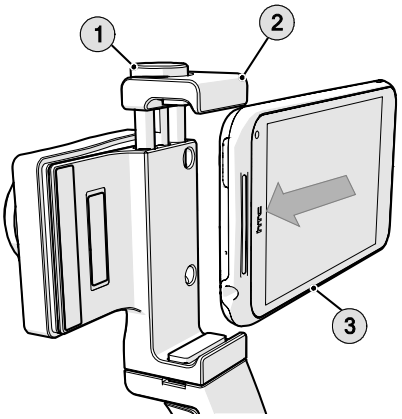
Safety and Caution Notes

- Attach Therm-App to your mobile device with care. Do not use any external tools as too much pressure might mark or damage your mobile device. Secure locking knob using your fingers only.
- Therm-App uses specific factory-prepared calibration data. If, during prolonged field usage of Therm-App, a degraded performance is noted, we recommend that you send the Therm-App device, for re-calibration. Please contact our support team at http://www.therm-app.com for further instructions.
- For the most accurate temperature measurement results, it is recommended to wait at least five minutes after Therm-App starts and before starting temperature reading.
- Therm-App manuals are updated from time to time, and product-critical notifications are published occasionally. To access the latest manuals and notifications, go to http://www.therm-app.com.
- Therm-App is a Class B digital product
- This product has been tested and found to comply with the limits for a class B digital product, pursuant to Part 15 of the U.S. FCC Rules.
- Some parts of Therm-App have sharp edges and could cause injury.
- Read this document in full, as well as the warranty document provided with the product.
- Do not drop Therm-App or apply pressure on the IR lens to avoid breaking the lens. If the IR lens breaks, do not touch the broken pieces, the pieces. Touching the broken lens pieces can cause injury.
- Do not point the infrared detector (with or without the lens and lens cover) at intensive energy sources, for example products that emit laser radiation, or the sun. This could damage the detector.
- Do not use Therm-App in a temperature environment higher than +50 degrees Celsius (+122 degrees Fahrenheit), unless specified otherwise in user documentation or technical data. High temperatures can cause damage to the detector.
- The Therm-App device is not sealed. Do not expose the Therm-App device to water, rain or dust.
- Do not apply solvents or similar liquids to the detector or the lens.
- The lens has a delicate anti-reflective coating. Clean the lens using a soft cloth applying very light pressure.
- During lens exchange, the IR detector is exposed. Avoid all contact with the detector. Do not touch, clean or blow air on the detector. Replacement of the lens must be done in a clean, dry area.
- Do not use pneumatic system pressurized air to remove dust from the Therm-App device. Pressurized air contains oil mist intended to lubricate pneumatic tools, this type of a pressurized air could damage the detector and lens.
- Power the Therm-App device with 5V DC connected through the micro USB connector only. Using any other type of power source may damage the Therm-App device.
- The Therm-App device is supplied with an appropriate USB-OTG cable. Use only the USB OTG cable provided. Using any other types of cables could damage the equipment.
- A label tamper is attached to one of the screws on the back of the Therm-App device. Removing this label voids the warranty.
- Temperature measurement is accurate in zoomed out mode only. If you pinch the screen for zoom in the temperature reading will not be valid.
- For more information, FAQ, and updated device compatibility views, please visit the Therm-App website: http://www.therm-app.com.
- As with most electronic products, Therm-App device must be disposed in an environmentally friendly way, and in accordance with existing regulations for electronic waste. Please contact our support team at http://www.therm-app.com for more details.

Quick Start Guide

1. Unpack Therm-App package.
2. Make sure the Android device is compatible with the Minimum Requirements.
3. Visit the Google Play online store and download the free **Therm-App Basic** app, or scan the QR code.
4. Install the Therm-App basic application on your Android device.
5. Verify that you have a stable internet connection.

6. Insert the Android device (3) into the Therm-App device Attachment bracket (2) and carefully fasten the Size knob (1).



7. Connect the Android device with the Therm-App device using the USB-OTG cable supplied.
8. Wait until download and initialization process are competed. For the first operation of the Therm-App device, downloading may take a few minutes.
9. Read and confirm the user agreement. The basic application is running and you are ready to start using your Therm-App.

Product Description

Therm-App is a revolutionary concept that extends human vision by turning an Android device into a thermal camera. This lightweight, modular, high resolution device clips onto your Android device. Therm-App provides your Android device with a capability of a powerful camera, able to display, record and share thermal images.

Therm-App runs an entirely new suite of exciting night vision and thermography applications.

Therm-App combines the power of a fully functional thermal camera with the mobility, processing power, display capabilities and advanced features provided by Android devices today.

The Therm-App device main components:

- Android device [1] (not supplied with Therm-App).
- USB-OTG cable [2]
- Therm-App device [3]

The Therm-App device includes:

- Therm-App device housing [2]
- Lens [1] – with exchangeable option
- OTG port [5] – for communication with the Android device.
- Attachment bracket [4] – connects the Therm-App device with the Android device.
- Size knob [3] – for adjustment to fit different sizes of Android devices

Minimum Requirements

- Android device running an Android ver. 4.1 or above.
- Android device supporting USB OTG (On-The-Go, also known as USB host mode).
- USB-OTG cable, male to male, microUSB.
- Important Note: Most off-the-shelf cables are not USB-OTG and will not operate with the Therm-App device. Use only the USB-OTG cables that are provided with the product.

Below is a partial list of supported devices:

- LG: Nexus 5, G2, Flex
- Samsung: Galaxy Note 3, Galaxy S3, Galaxy S4
- Sony: Xperia Z, C6603
- Zopo: C3
- HTC: One
- Motorola: Moto G
- For the full list visit: http://therm-app.com/therm-app-supported-devices/

Opening the Therm-App Box

The Therm-App box contains:

- Therm-App device with lens (P/N TA19A17Q-1000)
- 17 cm USB-OTG cables (P/N TA00000C-0017)
- 21 cm USB-OTG cables (P/N TA00000C-0021)
- Quick start guide (P/N D01642-001)

According to client specific order, the following optional accessory may be included in the box:

- 6.8 mm lens (P/N TA68A000-0000)

Installation

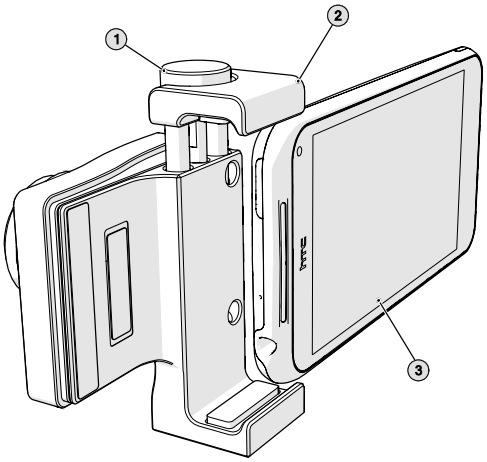
Installing the Application

1. Make sure the Android device operating system (OS) is either version 4.1 or above, supporting USB On-The-Go.
2. Visit the Google Play online store and download the free **Therm-App Basic** app, or scan the QR code.

Connecting Therm-App to the Android Device

1. Turn the Size knob (1) so the Android device slides (3) in the Attachment brackets (2).
2. Attach Therm-App to the back of the mobile device by turning the size knob.
3. Fasten the Size knob (1) and the Attachment bracket (2) to fit the Android device. Ensure that the device is firmly attached.

Note: Do not fasten the size knob too tightly. Fastening the size knob too tightly could damage the Android device.



1. Connect the USB-OTG cable to both Therm-App [1] and the mobile device (2).

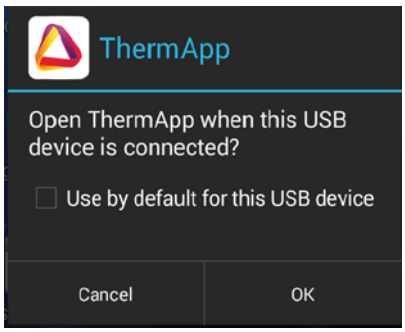
Note: *Use only the USB-OTG cable supplied. In most cases, the micro USB cables supplied with mobile phones do not support the USB-OTG functionality.*

Note: *Verify that the USB-OTG cable is connected properly to the Therm-App device and to the mobile device.*

Notes: *For the first use of the Therm-App device with an Android device, an initialization process must be completed. This process may take a few minutes and must not be interrupted. Make sure you have a stable internet connection prior to connecting your mobile device to the Therm-App device. Perform download using internet connection with no environmental interference.*

Application Operation

Initialization



This section is relevant to the first connection between the Therm-App device and a new Android device.

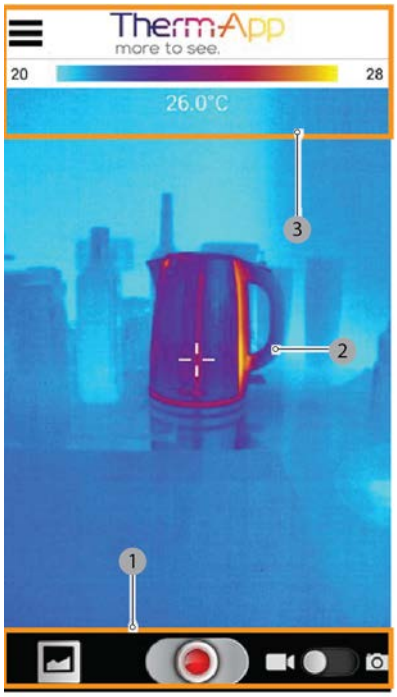
The Android device asks for your permission to associate the USB port with the Therm-App application.

1. Select the **Use by default for this USB device** check box and tap the OK. The Therm-App application (App) automatically starts and displays the **Terms and conditions** screen. Review and accept the **Terms and conditions**.
2. The App shows the **Initializing** message and downloads files which are specific to your Therm-App device (per device serial number). When download is completed, the App displays the Camera View screen.

Camera View

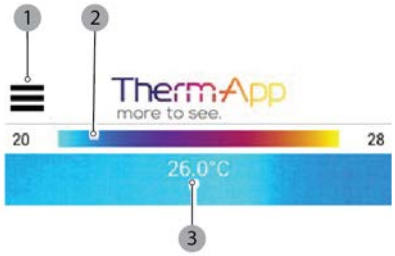
The **Camera View** screen includes:

- Upper Toolbar (3)
- Image display (2)
- Lower toolbar (1)



Upper Toolbar

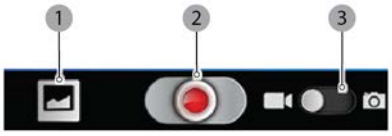
The upper toolbar includes:



- **Settings button (1)** – for configuring the Therm-App Settings.
- **Temperature bar (2)** – presents the range of temperatures currently viewed. The minimum and maximum temperatures are displayed on both sides of the bar.
- **Temperature reading (3)** – displays the temperature at the center of the image (marked by the cross hair).
- **Set button (4)** – enables entering new parameters.

Lower Toolbar

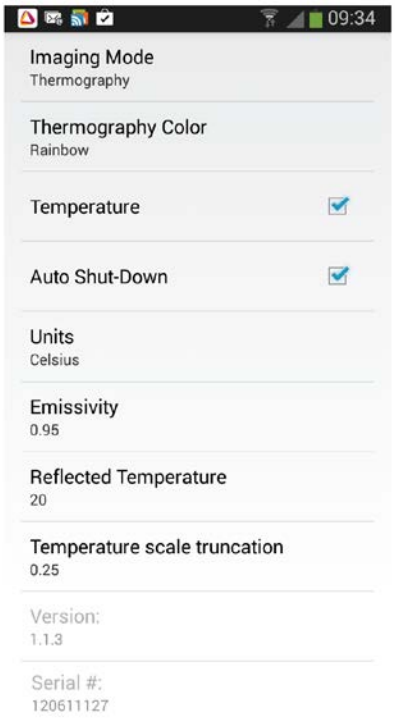
The lower toolbar includes:



- **Gallery (1)** – displays pictures stored in the Android device default album application.
- **Shooting Mode (3)** – switches between video and still image modes.
- **Shooting button (2)** – according to the selected shooting mode (3), starts and stops video recording, or takes a photo.

Therm-App Settings

Tap the Settings button located on the upper toolbar. The Settings screen is displayed and includes:



- Imaging Mode – switches between Night Vision and Thermography modes.
- **Thermography Color** – enables selecting thermography color palettes.
- **Temperature** – selecting the Temperature checkbox activates readings of temperature measured at the center of the image view (at the cross hair mark).
- **Disable sleep mode** – Selecting the checkbox deactivates the Android device sleep mode.
- **Units** – switches temperature readings between Celsius and Fahrenheit.
- **Emissivity** – for Adjusting Emissivity.
- **Reflected Temperature** – for Adjusting the Reflected Temperature.
- Temperature Scale Truncation – for Adjusting the Temperature Truncation.
- **Version** – displays the App version.
- **Serial Number** – displays the Therm-App device serial number.

3. Tap the Back button to exit the **Settings** screen and return to the Camera View screen.

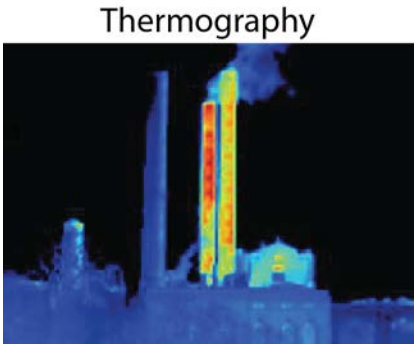
Imaging Mode

The Therm-App device image can be displayed in one of two modes.

To change the imaging mode:

1. Tap the Imaging Mode option on the Therm-App Settings screen.
2. Select one of the following modes:

- **Night Vision** - displays video image using 256 shades of gray. This mode displays more detailed image, useful for human observation during surveillance and detection.
- **Thermography** - image pixels are colored in relation to their temperature. On the default rainbow palette, the blue indicates the coldest measured temperature and red represents the hottest temperature measured. This mode is useful with applications searching for temperature differences on the scanned scene. The color palette is selectable.



> ***Notes:*** *Temperature measurements are stabilized about five minutes after activating the Therm-App device.*
>
> *Thermography measurement of temperatures calculation might be influenced by the environment of the measured objects, the surrounding objects reflected temperature, and the measured object emissivity.*

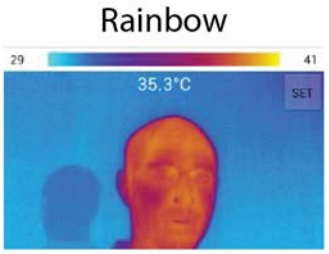
Setting Thermography Color

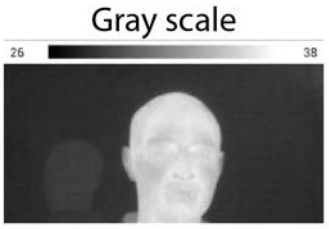
When the Thermography mode is selected, the Therm-App device image can be displayed using one of three palettes.

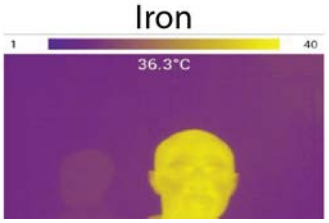
To change the selected palette:

1. Tap the Thermography Color option on the Therm-App Settings screen.
2. Select one of the following palettes:

- Rainbow
- Gray
- Iron







Adjusting Emissivity

Emissivity is a characteristic of the material being observed. Emissivity is the ability of the material surface to emit energy by radiation. The emissivity value (0 – 1) represents the ratio of energy radiated by the material being observed to the energy radiated by a black body at the same temperature.

To adjust the emissivity:

1. Tap the Emissivity option on the Therm-App Settings screen.
2. Scroll to the correct emissivity ratio and tap the Set button.

Adjusting the Reflected Temperature

Reflected temperature represents the energy emitted by the surrounding objects and reflected by the measured surface.

To adjust the reflected temperature:

1. Tap the Reflected Temperature option on the Therm-App Settings screen.
2. Scroll to the correct temperature and tap the Set button.

Adjusting the Temperature Truncation

Within every image frame, the temperature span is calculated and displayed on the top of the thermography image. Use this parameter to define the minimum number of pixels (defined by percentage) require to impact the temperature span calculation. This setting prevents a small number of pixels to reduce the temperature measuring resolution.

To adjust the truncation scale:

1. Tap the Temperature Truncation option on the Therm-App Settings screen.
2. Scroll to the correct temperature and tap the Set button.

Specifications

General Information	
Resolution	384 x 288 pixels (>110k pixels)
Spectrum	LWIR 7.5 -14um
Lens Options and FOV	6.8mm lens (55 x 41^0) 19mm lens (19 x 14^0)
Frame Rate	8.7Hz
Weight	138 grams / 4.87 ounces (with 19mm lens)
Size	55 x 65 x 40mm (2.16 x 2.55 x 1.57 in)
Operating Temperature	-10°C to +50°C (-4°F to +122°F)
Power Supply	5V over USB cable
Power Consumption	Less than 0.5W
Certifications	CE, FCC
Device Attachment	Clip-on for smartphone (5 -10cm span)
Mobile Platform Support	USB OTG (On The Go) compatible devices
Mobile OS Compatibility	Android 4.1 and
Recording and Sharing	Therm-App™ Smartphone App plus any sharing App

Imaging Modes	
Thermography	Color temperature mapping: 5°C to 90°C Available palettes: Rainbow, Iron, Grayscale
Enhanced Vision	High-resolution thermal imagery (grayscale day/night vision) NETD <0.07°C

Troubleshooting

Before starting any troubleshooting procedure, make sure that:

- The Android device is compatible with Therm-App.
- The Therm-App Basic application is installed from Google Play.
- Therm-App and the Android device are connected properly via a USB-OTG cable.
- Verify that your cable is OTG compatible:

1. Plug the USB OTG cable into the Android device USB port.
2. Verify that the **USB connector connected** message appears on top of the screen. Replace the cable if this message does not appear.

Table -1: Troubleshooting List

No.	*Problem | System Failure*	*Indication*	*Solution*
1	*Application does not start.*	*App is not initiated after connecting to Therm-App.*	*Ensure that USB OTG cable is properly connected between the Android device and Therm-App device.* *Verify that you are using a USB-OTG cable.* *Ensure that the Therm-App Basic app is installed from Google Play.*
2	*Application shuts off.*	*Application shuts itself off.*	*Ensure that USB OTG cable is properly connected between the Android device and Therm-App device.* *Verify that you are using a USB-OTG cable.*
3	*Repeated initialization*	*Each startup Therm-App performs the initialization process.*	*From the Apps menu, select **My files** > **all files** > **Thermapp**.* *Delete folder with a serial number tag.* *Re-install Therm-App Basic application.* *Plug the Therm-App device again.*
4	*Battery saver interrupts Therm-App.*	*Android device switches to sleep mode.*	*Select the Disable screen timeout check-box on the Therm-App Settings screen.*
5	*Therm-App App is not found.*	*The Android device switches to **Safe mode**.*	*Unplug the USB-OTG cable.* *Restart the Android device.* *Connect the Therm-App device with the Android device.*
6	*Application screen is not displayed*	*A messages screen appears on App startup*	*Press the Android **Home** button to exit the App and reconnect Therm-App and the Android device.*
7	*No active view*	*Camera view is not displayed after completing app initial setup*	*From the Apps menu, select **My files** > **All files** > **Thermapp**.* *Delete folder with a serial number tag.* *Re-install Therm-App Basic application.* *Plug the Therm-App device again.*
8	*Video not displayed on the Android device.*	*Blank screen*	*Ensure that the Android device is turned on.* *Ensure that the Therm-App device lens is not covered or blocked.* *Ensure that USB OTG cable is properly connected between the Android device and Therm-App device.*
9	*Noisy image*		*Ensure that USB OTG cable is properly connected between the Android device and Therm-App device.* *Ensure that nothing is obstructing the Therm-App device view.* *Check that the camera lens is clean.* *Ensure that line of sight is not blocked by glass or other transparent materials.*

No.	*Problem | System Failure*	*Indication*	*Solution*
10	*Unfocused image*	*Image blurred*	*Turn the lens focus ring while pointing the Therm-App device to a sharp edged object.* *Do not turn the lens focus ring too far as the focus ring could slip out of place.*
11	*Inaccurate temperature readings*	*Temperature readings are too high*	*From the Apps menu, select **My files** > **All files** > **Thermapp**.* *Delete folder with a serial number tag.* *Re-install Therm-App Basic application.* *Plug in the Therm-App device again.*
12	*Battery quick discharge.*	*Android device battery discharges quickly.*	*Disconnect the USB-OTG cable when Therm-App is not in use.*